What is claimed is:

1. A device for supplying air to fuel cells comprising a compressor situated upstream from the fuel cell and an expander situated downstream from the fuel cell,
wherein the compressor (5) is designed as a claw compressor having at least two engaging compressor wheels (7, 7') and the expander (6) is designed as a claw expander having at least two engaging expander wheels (9, 9').

2. The device as recited in Claim 1,
wherein the compressor wheels (7, 7') and the expander wheels (9, 9') each have at least two compressor claws (8, 8') and two expander claws (10, 10'), respectively.

3. The device as recited in Claim 1 or 2,
wherein the compressor wheels (7, 7') and the expander wheels (9, 9') are mounted on common shafts (15, 15').

4. The device as recited in Claim 3,
wherein the common shafts (15, 15') are connected to a synchronizing gear unit (18).

5. The device as recited in one of Claims 1 through 4,
wherein the compressor (5) and the expander (6) have the same rotational direction (A) and a mirror-inverted design.

6. The device as recited in one of Claims 1 through 5,
wherein the compression ratios (P_2/P_1, P_3/P_4) produced by the compressor (5) and the expander (6) are defined by the designs of same.

7. The device as recited in one of Claims 1 through 5,
wherein the compression ratios (P_2/P_1, P_3/P_4) produced by the compressor (5) and the expander (6) are adjustable.

8. The device as recited in one of Claims 1 through 7,
wherein the pumping chamber of the expander (6) is smaller than the pumping chamber (21) of the compressor (5).

9. The device as recited in Claim 8,
wherein the size of the pumping chamber of the expander (6) is 0.3 to 0.6 times the size of the pumping chamber of the compressor (5).

10. The device as recited in one of Claims 1 through 9,
wherein the compressor (5) and the expander (6) are cooled via expansion cooling.

11. The device as recited in Claim 10,
wherein the expander (6) is situated on the side of the synchronizing gear unit in order to obtain expansion cooling of the compressor (5) and the expander (6).

12. The device as recited in Claim 10 or 11,
wherein the gas exiting the expander (6) is supplied to the compressor (5).

13. The device as recited in Claims 10, 11, or 12,
wherein the compressor (5) and the expander (6) are situated in a common housing (20).

14. The device as recited in Claim 13,
wherein the housing (20) has a double wall.